

Appendix B

Navy Well Drilling

B-1. General. The Naval Construction Force (NCF) Seabees, as part of their primary mission, are tasked to provide water-well-drilling support for the Marine Corps. Doctrine for this support is in OH13-4/NWP 22-9. Each naval mobile construction battalion (NMCB) table of allowances (TOA) includes four water-well-drilling technicians (NEC 5707) and well-drilling equipment and materials to develop water wells from deep subsurface aquifers. To accomplish the well-drilling missions, well-drilling teams deploy from an NMCB by land, air, or sea.

B-2. Equipment. The NMCB TOA includes one International Standards Organization (ISO) air-transportable water drill (ITWD) (Figure B-1), one 750-psi/300-cfm air compressor, and two 1,500-foot well-completion kits.

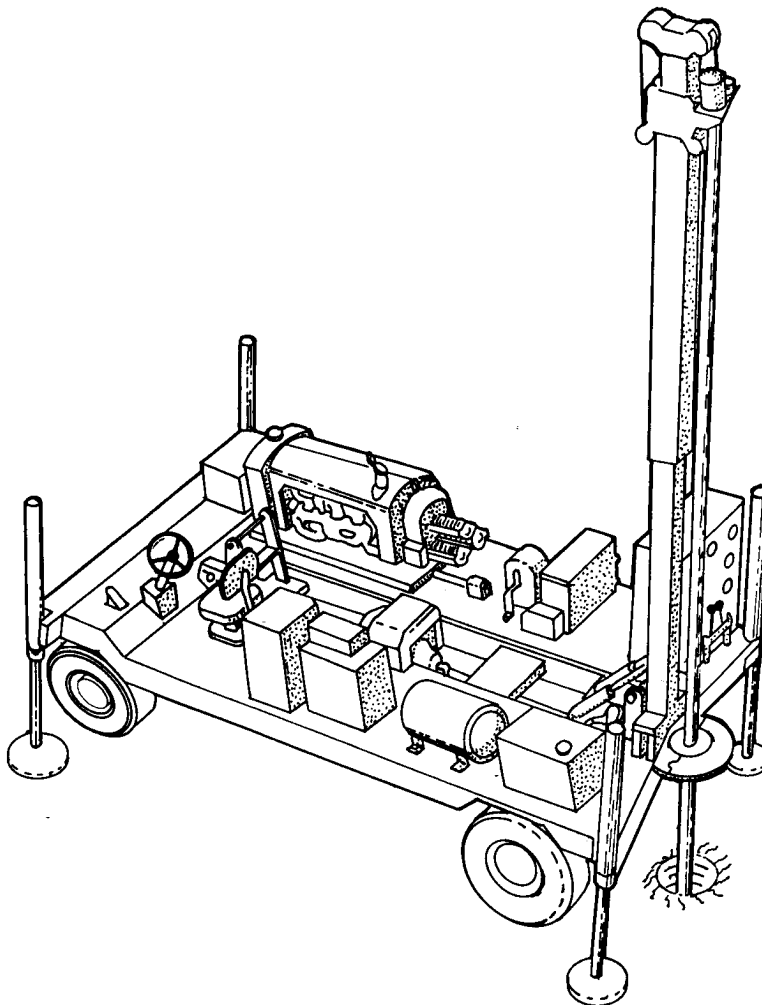


Figure B-1. ITWD machine

a. *The ITWD.* This machine replaces the LP- 12 1,500-foot well-drilling machine and the semitrailer-mounted Portadrills, models 501 and 521. The ITWD is an all-wheel-drive, self-propelled rig that can be shipped in a standard 8- by 8- by 20-foot ISO shipping container. The ITWD can also be shipped on a C-130 or larger aircraft without disassembly. The machine is an all-hydraulic, top-head drive unit with a telescoping mast capable of employing standard 20-foot drill steel. The ITWD has a top speed of 10 miles per hour (mph) and is not designed for over-the-road mobility. It is lightweight, highly mobile, and suitable for rapid deployment with Fleet Marine Force (FMF) engineer units. The machine is compatible with the Service Logistical Vehicle Systems (LVS). See Table B-1 for specifications on the ITWD.

Table B-1. ITWD specifications

Specifications	Overall Dimensions
Manufacturer: Ingersoll Rand	Length: 19 feet 3 inches
Type: ISO/ITWD	Width: 7 feet 5 3/4 inches
Weight: 25,000 pounds	Height (mast lowered): 7 feet
Shipping dimensions: 1,026 cubic feet	Height (mast raised): 31 feet
Fuel tank capacity: 72 gallons	Engine type: in-line, 6-cylinder, liquid-cooled, 4-stroke-cycle, turbocharged, diesel
Hydraulic reservoir: 56 gallons	Engine coolant capacity: 11.1 quarts
Top head rotation: 0 to 150 RPM	Maximum engine torque output: 370 pound-foot at 800 RPM
Derrick capacity pulldown: 13,000 pounds pullback: 30,000 pounds rotary torque: 60,000 inch-pound	Drilling capacity mud rotary techniques: 12-inch to 1,200-foot hole down-hole percussion: 6-inch to 1,500-foot hole through rock formations
Mud pump capacity: 150 GPM	Drawbar pull: 12,900 pounds
Water-injection pump capacity: 25 GPM	

The ITWD is capable of mud and air rotary drilling, rotary percussion, or down-hole hammer drilling, using an auxiliary air compressor. A mud pump, water-injection pump, in-line oiler, four corner-mounted leveling jacks, fore and aft pintle hooks, utility hoist, driller's station, and driver's station are mounted on the ITWD. The ITWD is deployed with a kit that includes lightweight drill steel, drill collars, tricone bits, down-hole air hammer, and miscellaneous subs and adaptors for drilling to a depth of 1,500 feet. Because of the various drilling capabilities, the ITWD can drill in any geological formation. If drilling requires the air compressor, it is brought to the site with the drill rig or delivered by a support vehicle. For mud-drilling operations, teams need a water truck and the equipment to dig the mud pits.

b. *Air Compressor.* One wheel-mounted, diesel-engine-driven, 750-cfm, 300-psig air compressor is included in each NMCB TOA for performing down-hole hammer drilling techniques. The ITWD is capable of towing this air compressor. The ITWD does not have an on-board air compressor.

c. *Well-Completion Kit.* Each NMCB TOA includes two 1,500-foot well-completion kits. Materials in these kits are considered consumable project materials. The kits are used to develop and complete a well. The supported unit is responsible for replacing the materials in the kits.